



National Spent Nuclear Fuel Program

Canister and Weld Development Update

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*Providing for safe,
efficient disposition of
DOE spent nuclear fuel*

Standardized DOE SNF Canister



- *Developed for use by DOE Complex along with MCO*
- *Robust performance*
- *Maintains containment under accident conditions*
 - *No breach part of license strategy for DOE SNF*
- *Full scale testing and validation of analytical models*

Drop Testing at Sandia National Laboratories



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Canister

FY 2002 Accomplishments

- *Revised ASME Section III, Division 3 to accommodate Standardized Canister closure*
- *Deployed High Integrity Canister to ANL-W for INEEL SNF use*



Status of ASME Code Changes

Change	Reason	Passed NUPACK	Current Status
Allow Field Operations	Final closure weld can be made at the loading site.	Yes Revised Subsection WA	Issued
Alternate Stamping Requirements	N-stamp is valid after acceptance of final closure weld.	Yes Revised Subsection WA	Issued
Allow Ultrasonic Testing for Weld Examination	UT instead of radiography can be used for final closure weld examinations.	Yes Revised WB-5279	Issued
Allow Leak Testing in Lieu of Pressure Testing	Option of helium leak testing can be used.	Yes but held by NUPACK Chair to coordinate with new revisions	Issued new Division 3 Code Case N-656



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Recent ASME Section III, Division 3 Proposals

- *At September 2002 ASME Code Week, proposal made to include draft Subsection WC (for storage containments) into existing Subsection WB (for transportation containments) due to similarities*
- *Revised Subsection WB to be coordinated with revised Subsection WA prior to new issuance*
- *Proposed changes to Subsection WB include provisions of Code Case N-595 to allow commercial SNF storage canisters to be built to Division 3 rules*



Recent ASME Section III, Division 3 Proposals - cont.

- *Proposed changes have interpreted storage containments to include repository disposal use*
- *Code Case N-656 (for inner transportation containments per NUREG-1617) issued but needs editorial corrections*



New Issue for Canister - NSNFP QAMA Comments

- *“Designing to the rules of ASME Section III is probably appropriate, however the the QAMA Team does not see the benefit of N-stamping the canister.”*
- *“There can be an inherent false sense of security that the quality produced by an N-stamped fabricator is consistently better than a non-stamp holder.”*
- *“The current number of potential N-stamp suppliers is limited.”*
- *“There are substantial costs associated with obtaining and maintaining an N-stamp, and administrative factors that could potentially affect schedule.”*



QAMA Recommendation

- *“NSNFP should perform a cost-benefit analysis justifying the requirements for N-stamping the Standardized Spent Nuclear Fuel Canister taking into account quality, cost, and schedule factors.”*



Canister Discussion Points

- *Standardized Canister has several uses*
 - *Storage*
 - *Transportation*
 - *Disposal*
- *DOE-EM estimated usage - 2800 to 3600*
- *Idaho Dry Storage Facility is NRC licensed*
- *Section III, Division 3, will replace Section III, Division 1, Code Case N-595*



Current Projects using ASME Section III Requirements

- *PFS application in June 1997, prior to any ASME rules for storage containers*
- *No unified commercial approach to storage containers, though N-595 exists*
 - *Maine Yankee (NAC International)*
 - *Diablo Canyon (Holtec International)*
 - *SONGS (Transnuclear, Inc.)*
- *NRC encouraging application of ASME code*

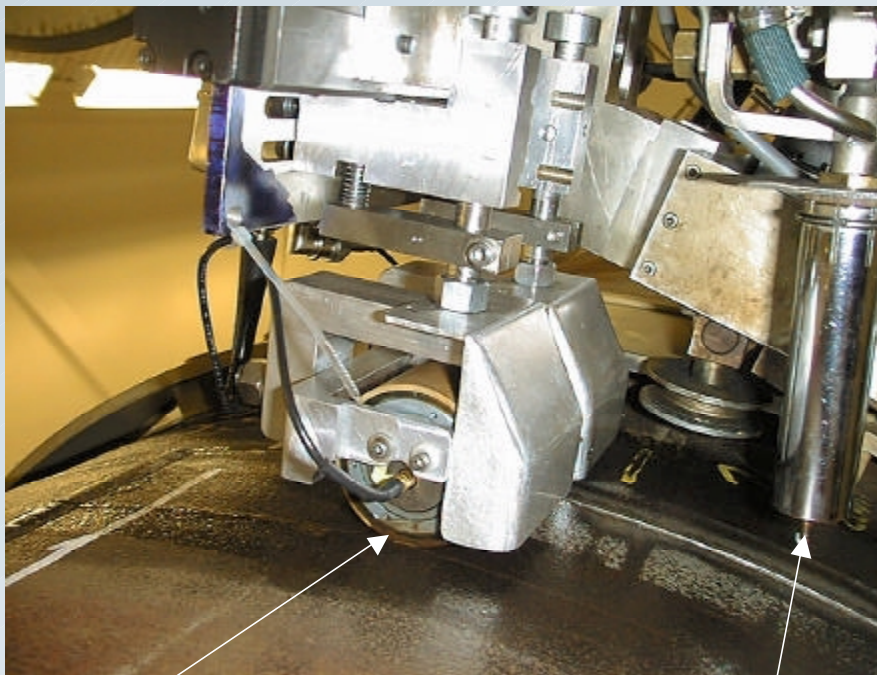


NSNFP Position

- *The Standardized Canister should be N-stamped to demonstrate confinement vessel for interim storage*
- *NRC acceptance of N-stamped canisters containing SNF for disposal*
- *Little value seen in performing cost-benefit analysis*
- *Comments on NSNFP position*



Developing remote welding and NDE capabilities



NDE Head

Weld Head

- *Needed for final closure welds in high-radiation fields*
- *Minimal heat input for welding and repair*
- *Provide full visual, surface, and volumetric inspection*
- *Real-time nondestructive examination*



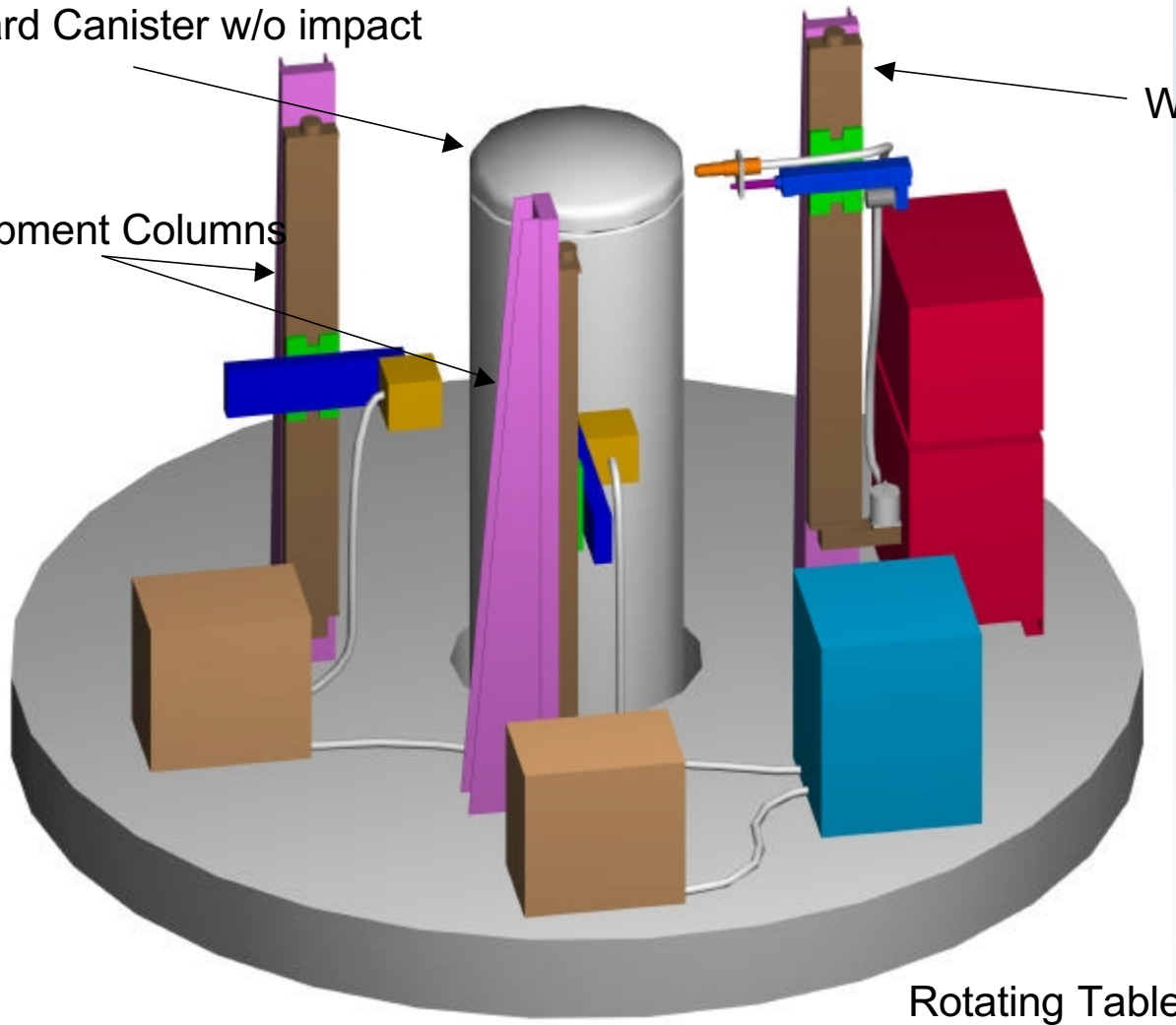
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Canister Welding and NDE Equipment Concept

SNF Standard Canister w/o impact limiter

Repair Equipment Columns

Welding Column

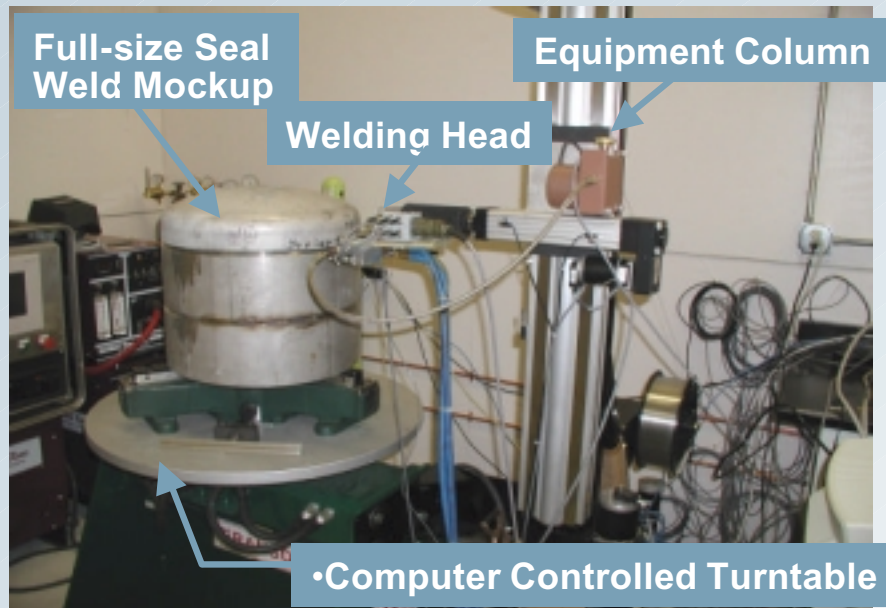


Rotating Table



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Remote Welding & Repair

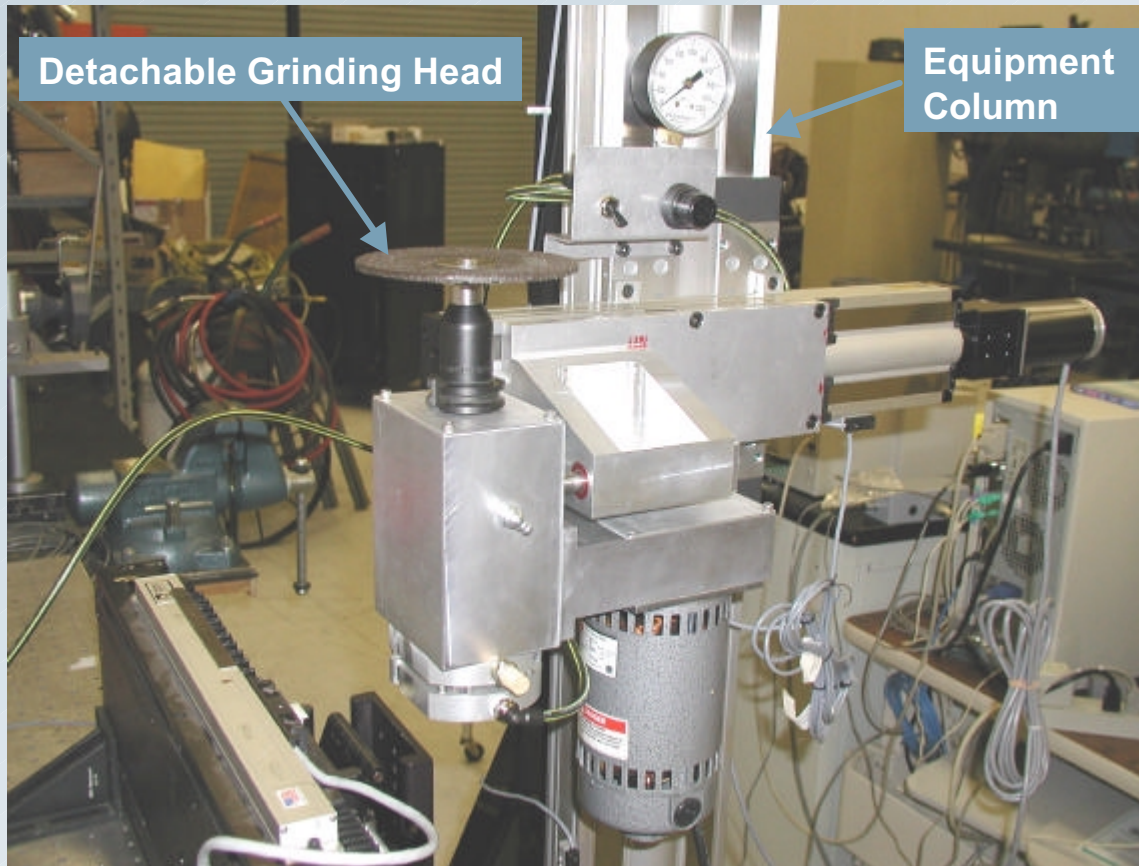


- Computer Controlled
- Low-Cost Power Supplies
- Remote Joystick Control
- Low-Cost Vision System with Complete Welding Arc Light Attenuation
- Independent Real-time Parameter Adjustment



- Complete Integration with Repair and NDE Equipment
- Permanent Record Capability
- Only Minor Modifications Required for Different Field Applications

Repair Equipment



- Remote Operation
- Computer Controlled
- Contour Weld Joint Grinding Capabilities
- “3-D” Manipulation
- 10,000 RPM
- 5 in. Diameter Disk
- Air-operated Detachable Head
- Contact Sensor
- Usage Sensor
- Integrated with Other Weld and NDE Equipment



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High Integrity Canister (HIC)

- *Developed for handling and packaging of failed fuel*
- *Material - Hastaloy C-22*
- *Designed to withstand 30 ft drop*
- *Removable screw on lid*
- *Seal leak rate less than 10^{-4} cc/min*
- *First HIC completed June 2002*
- *First HIC deployed for packaging sectioned TRIGA rods*

